

LDMX: The Light Dark Matter eXperiment

Monday, 1 August 2022 19:00 (40 minutes)

The constituents of dark matter are still unknown, and the viable possibilities span a very large mass range. The scenario where dark matter originates from thermal contact with familiar matter in the early Universe requires the DM mass to lie within about an MeV to 100 TeV. Considerable experimental attention has been given to exploring Weakly Interacting Massive Particles in the upper end of this range (few GeV – \sim TeV), while the region \sim MeV to \sim GeV is largely unexplored. If there is an interaction between light DM and ordinary matter, as there must be in the case of a thermal origin, then there necessarily is a production mechanism in accelerator-based experiments. The Light Dark Matter eXperiment (LDMX) is a planned electron-beam fixed-target missing-momentum experiment that has unique sensitivity to light DM in the sub-GeV range. Relevant to NuFact, LDMX is capable of measuring inclusive and semi-exclusive lepton scattering that can be used to inform interaction modeling for neutrinos in a way that is complementary to other neutrino and electron scattering experiments. Relevant to the muon working group is a proposal for a muon beam version of LDMX that would probe the electron-phobic scenario. This contribution will give an overview of the theoretical motivation, the main experimental challenges and how they are addressed, the status of the LDMX experiment, as well as projected sensitivities in comparison to other experiments.

Attendance type

In-person presentation

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